

## ABSTRACT OF THE DISCLOSURE

An instrument and related process for measuring color, shade, gloss, shape and/or translucence of a tooth. First, the instrument uses searchlight illumination to illuminate a tooth with constant irradiance. Second, the instrument uses colorimetric imaging to collect time-separated frames of different wavelengths of light reflected from a tooth and to combine those frames into a color image. Third, the instrument includes a sanitary shield to establish a reference color and a predetermined distance to a target tooth. Fourth, the instrument provides line-of-sight viewing so an operator may simultaneously view a display of the image on the instrument and the object being measured. Fifth, the instrument is impervious to pollutants because it incorporates a sealed measurement window. Sixth, optical measurements of a tooth taken by a dentist are compared to optical measurements of a prosthetic restoration for that tooth to confirm satisfactory matching of optical characteristics of the tooth and restoration.

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